

CARBORUNDUM

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THE CARBORUNDUM COMPANY

SOLE MANUFACTURERS OF

CARBORUNDUM

(ACHESON'S PATENT)

NIAGARA FALLS, NEW YORK, U. S. A.

Branch Stores

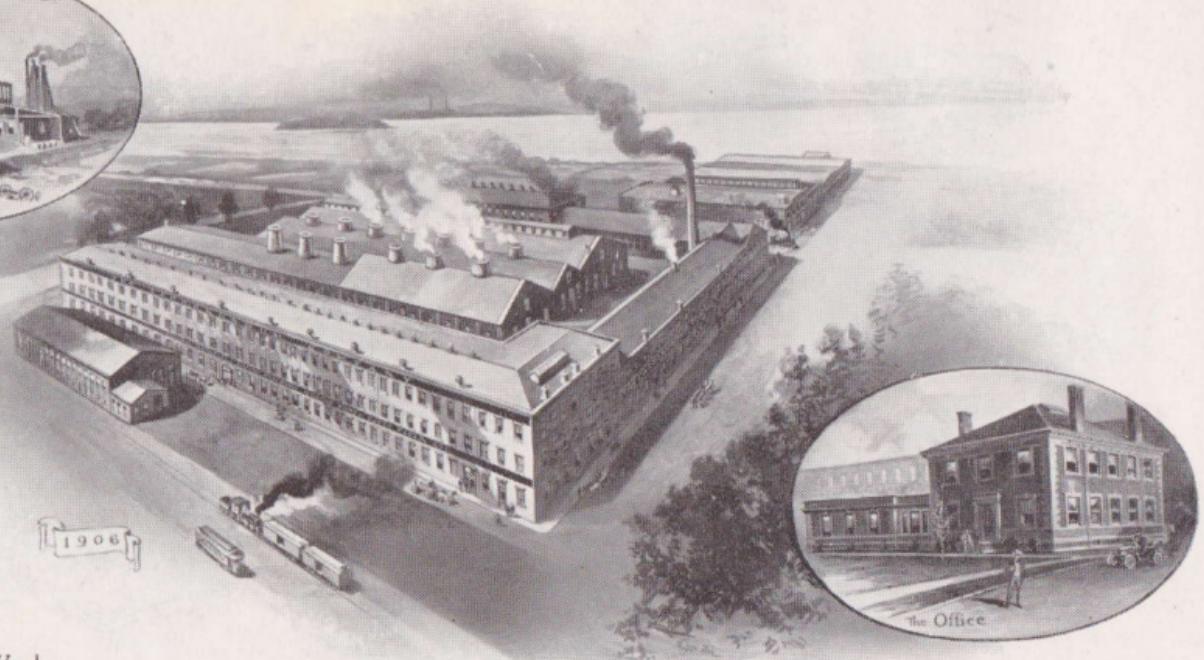
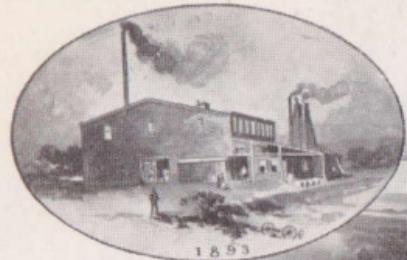
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THE CARBORUNDUM COMPANY
NIAGARA FALLS, N. Y.



The Carborundum Company has received the Highest Awards for Superiority that have been Conferred at All Important Expositions.
Grand Prize for Abrasives, St. Louis, 1904.



Niagara Falls Works
Floor Space 276,292 Square Feet

Carborundum

CARBORUNDUM is a manufactured material made by combining carbon and silicon, two of the hardest known elements. Ordinary coke is crushed and ground to a fine powder and mixed in proper proportions with common glass sand. Salt and sawdust of determined quantities are added to this mixture for mechanical purposes.

This mixture of coke, sand, sawdust and salt is then placed in an electric furnace and for thirty-six continuous hours an electric current of one thousand horse-power of energy is passed through the furnace, subjecting the mixture to a heat of approximately 7,000 degrees fahr. When the furnace is cool, the mixture is found converted into large masses of beautiful colored crystals of exceedingly brilliant luster.

After the carborundum crystals have been removed from the furnace they are crushed to separate the mass of crystals apart, then thoroughly washed, dried and screened to the different sizes; twenty in number, from No. 8 to No. 220, the number indicating the meshes to the linear inch of the screen through which the crystals have passed. In addition to the screen numbers, there are three grades of powders, F, FF and FFF, which are obtained by floating in a stream of water through a series of tanks, which serve to collect these fine powders.

Characteristics of Carborundum

HARDNESS: Diamond is the only material exceeding it in hardness. It cuts emery, corundum and all other abrasives, natural or manufactured, with ease. It is the hardest substance made.

Shape and Sharpness: The crystals are hexagonal in shape, free from cleavage lines, so that when crushed into grains are very irregular, sharp-pointed cubes. No known abrasive approaches Carborundum in sharpness of crystal.

Brittleness: Not so tough as the diamond, closely resembling corundum in this respect.

Weight: Its specific gravity is 3.12. One pound of carborundum is equal in volume to one and one-quarter pounds of emery.

Infusibility: Infusible at the highest obtainable heat.

Insolubility: It is insoluble in any of the ordinary solvents. Water, oils and acids have no effect upon it.

Products

THE manufacture of carborundum and carborundum products embraces: Crude carborundum crystals, grains and powders, carborundum wheels, dental wheels and discs, cup and cylinder wheels, carborundum sharpening stones, razor hones, combination stones, scythe stones, knife sharpeners, ax stones, oil stones, sticks, slip stones, rubbing bricks, scouring blocks, carborundum paper and cloth, and paper and cloth discs. In fact, every form in which abrasives may be used.

The Carborundum Company's Works are as complete and perfect as science and art, supported by unlimited capital, can make them, carrying the processes through from the raw material to the finished articles.

All goods are sold under guarantee of superiority to emery and other abrasives, and profitable results to the purchaser.

Crystals, Grains and Powders

CRUDE Carborundum, as taken from the electric furnace, usually consists of large masses of crystals. Frequently, these are exceedingly beautiful in color and of brilliant luster.

Grain Carborundum is produced by crushing and grinding the crude, treating with acids, and separating by sieves into various sized grains. These are numbered, the same as emery, in accordance with the number of threads per linear inch of the sieve through which they pass. Thus, No. 50 grain has passed through a sieve having fifty threads to the inch, but would not pass through one having sixty. We carry in stock numbers 6, 8, 10, 12, 14, 16, 20, 24, 30, 36, 40, 50, 60, 70, 80, 90, 100, 120, 150, 180, 220.

Powders are the particles too fine to size by sieving. They are graded by floating in water or other liquid. F, FF and FFF powders are graded in flowing water. They include in their numbers all grades of fineness from F, the next finest after 220, to FFF, which contains the very finest dust.

Prices

Crude Carborundum Crystals (Selected)

	Per Pound
Any quantity, carefully packed.....	\$0.50

Grains, Nos. 6 to 60, and Nos. 150 to 220 (Inclusive)

One-half keg (150 pounds) or more, of one number.....	.10
Fifty to 150 pounds, of one number.....	.12
Five to 50 pounds, of one number.....	.15
One, two, three and five pounds, in tin cans, of one number.....	.17

Grains, Nos. 70, 80, 90, 100 and 120

Fifty pounds, or over.....	.12
Five to 50 pounds, of one number.....	.15
One, two, three and five pounds, in tin cans, of one number.....	.17

F, FF, FFF Powders

One-half keg (150 pounds) or more, of one number.....	.08
Fifty to 150 pounds, of one number.....	.09
Five to 50 pounds, of one number.....	.10
One, two, three and five pounds, in tin cans, of one number.....	.12

Carborundum Wheels

CARBORUNDUM Crystals being extremely hard, very sharp, sufficiently brittle to permit of their breaking, while in service, into irregular shapes; also, being insoluble in all liquids and infusible in the highest attainable heat, make an ideal material of which to manufacture grinding wheels for use under any and all conditions.

Carborundum wheels are made by what is known as the vitrified process. Specially selected clays of high tensile strength are mixed in certain proportions with the crystals or carborundum grains. This mixture is carefully spread uniformly in a mold, of the desired shape or form of wheel, and pressed in a hydraulic press. The wheel, when removed from the mould, is placed in a "sagger," which is made of baked clay.

The vitrification of the wheel is carried on in kilns, similar in form to those used in the manufacture of porcelain ware.

The saggers, containing wheels, are placed inside the kiln one upon another, in the form of columns, to the very roof of the kiln. When the kiln is filled it is closed, and coal fires started in the fire-boxes. The fires are very gradually increased until the heat is sufficient to fuse the

clays in the wheels; the firing is then stopped and the fire-boxes are sealed air-tight. The operation of burning a kiln occupies about seven days.

This fusing or vitrification converts the clays into a strong porcelain binder, holding the Carborundum Crystals together and making solid but sufficiently porous wheels, not affected by water or other liquids.

After the wheels are taken from the kiln they are placed in lathes and trued up with dressers. A lead bushing of the desired size of arbor formed into the center hole, and the face of the wheel trued accurately with the arbor hole.

Great care is exercised to make sure that every wheel is in perfect balance. Every wheel of eight inches and over in diameter is run at a test speed subjecting it to fully twice the stress it receives under normal working conditions.

Another point of interest in carborundum wheels: The weight of emery and corundum is about twenty-eight per cent. greater than that of carborundum. Carborundum wheels are, therefore, proportionately lighter than those made of emery or corundum, a matter of much importance when considered in connection with the high speed at which wheels are run, the breaking stress being proportionate to the weight.

Grade of Wheels

GRADE indicates hardness, and refers to the nature of the binding material, the character and quantity of which are almost as important as the cutting material itself. It must be selected with extreme care, with reference to the kind and form of the material to be ground.

To successfully meet all conditions, we make our wheels in nineteen degrees of hardness. Letters arranged in a scale are used to designate these degrees, from "D," very hard, to "V," very soft.

To select a wheel to fill any given order, it is necessary that we know: (1) The number or grit of carborundum (grit indicates the coarseness or fineness of the grain; for sizes see page 8). (2) The required hardness, indicated by the proper letter on the grade scale. All classes of work do not require such extreme nicety of number and grade; but the more accurate the selection, the better will be the wheel's efficiency.

Customers ordinarily know the size or number of grain desired; but in many cases the selection is left to our experience, governed by information submitted.

Directly before shipment every wheel is carefully inspected and accurately graded by competent persons. Any mistake or omission in grading should be at once reported to us.

Selecting Wheels for High Efficiency

WHEN selecting a wheel for any kind of work, three considerations should determine the choice :

1. The rapidity of grinding or cutting desired.
2. The total amount of work to be performed.
3. The finish to be produced.

These three elements are usually of value in the order here given. The speed of a wheel and all other operating conditions being the same, they are influenced as follows :

1. The rapidity of cutting is increased by using a coarser grit or a softer grade.
2. The total amount of work performed by a wheel is increased by using a finer grit or a harder grade.
3. The finish produced by a wheel is increased by using a finer grit together with a softer grade.

All of our wheels are sold under guarantee that the joint effect of these three elements will show higher efficiency than is obtainable with emery wheels.

Variations in the conditions under which wheels are operated precludes the adoption of a fixed schedule of grit and grade for any specific work.

We will, however, upon application, furnish a tabulated list of grits and grades of wheels for different classes of work.

Safety of Wheels

THE conditions under which grinding wheels are used are subject to so many variations, and the chances for accidents so numerous, it is in all cases extremely desirable to know for a certainty that no flaw exists in the wheel, and that it is sufficiently strong to stand the work. To this end, we have an established system of testing that completely obviates the possibility of a defective wheel leaving our Works.

Every wheel of eight inches and over in diameter is run at not less than forty per cent above the authorized nominal operating speed, thereby subjecting it to fully twice the stress it receives under nominal working conditions. In addition, great care is exercised to make sure that every wheel is balanced.

The manner of mounting has much to do with the safety of a wheel. It should slide on the mandrel rather loosely, sufficiently close not to wabble, but under no circumstances must it be forced.

The test and inspection which each wheel receives before leaving the Works insures its perfect condition when shipped, but rough handling either in transit or after unpacking may injure it so that it is unsafe to run. Before mounting, it should be lightly tapped with a hammer; if it does not ring with a clear tone, it should not be used.

Price List of Regular Carborundum Wheels

Diam. in Inches	THICKNESS OF WHEELS IN INCHES															Rev. per Minute for Surface Speed of 5,000 ft.		
	1/4	5/8	1/2	5/8	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2	2 3/4	3	3 1/4	3 1/2	4	
1	\$0.25	\$0.30	\$0.30	\$0.35	\$0.35	\$0.40	\$0.45	\$0.50	\$0.55	\$0.60	\$0.65	\$0.70	\$0.75	\$0.80	\$0.85	\$0.90	\$1.00	19,099
1 1/2	.30	.35	.40	.45	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.10	12,733
2	.35	.45	.50	.55	.55	.60	.65	.70	.75	.80	.85	.90	.95	1.00	1.05	1.10	1.20	9,549
2 1/2	.40	.55	.65	.70	.75	.85	.95	1.05	1.15	1.25	1.35	1.45	1.55	1.65	1.75	1.85	2.05	7,639
3	.50	.65	.80	.90	.95	1.10	1.25	1.40	1.55	1.70	1.85	2.00	2.15	2.30	2.45	2.60	2.90	6,366
3 1/2	.60	.80	.95	1.05	1.15	1.35	1.55	1.75	1.95	2.15	2.35	2.55	2.75	2.95	3.15	3.35	3.75	5,457
4	.75	.95	1.10	1.25	1.35	1.60	1.85	2.10	2.35	2.60	2.85	3.10	3.35	3.60	3.85	4.10	4.60	4,775
5	1.00	1.20	1.40	1.60	1.80	2.20	2.60	3.00	3.40	3.80	4.20	4.60	5.00	5.40	5.80	6.20	7.00	3,820
6	1.40	1.60	1.75	2.10	2.40	3.05	3.70	4.35	5.00	5.65	6.30	6.95	7.60	8.25	8.90	9.55	10.85	3,183
7	1.85	2.00	2.15	2.60	3.00	3.85	4.70	5.55	6.40	7.25	8.10	8.95	9.80	10.65	11.50	12.35	14.05	2,728
8	2.10	2.35	2.60	3.10	3.60	4.60	5.60	6.60	7.60	8.60	9.60	10.60	11.60	12.60	13.60	14.60	16.60	2,387
9	2.50	2.80	3.10	3.70	4.25	5.40	6.55	7.70	8.85	10.00	11.15	12.30	13.45	14.60	15.75	16.90	19.20	2,122
10	3.00	3.35	3.65	4.35	5.00	6.35	7.70	9.05	10.40	11.75	13.10	14.45	15.80	17.15	18.50	19.85	22.55	1,910
12	3.60	3.80	4.00	5.00	6.00	7.40	9.00	10.70	12.75	14.00	15.70	17.40	19.00	20.75	22.50	24.25	27.50	1,592
14	4.05	5.15	6.25	7.35	8.45	10.65	12.85	15.05	17.25	19.45	21.65	23.85	26.05	28.25	30.45	32.65	37.05	1,364
16					10.85	13.70	16.55	19.40	22.25	25.00	27.95	30.80	33.65	36.50	39.35	42.20	47.90	1,194
18					13.25	17.00	20.75	24.50	28.25	32.00	35.75	39.50	43.25	47.00	50.75	54.50	62.00	1,061
20						20.25	24.75	29.25	33.75	38.25	42.75	47.25	51.75	56.25	60.75	65.25	74.25	955
22						25.00	31.00	37.00	43.00	49.00	55.00	61.00	67.00	73.00	79.00	85.00	97.00	868
24						29.00	36.00	43.00	50.00	57.00	64.00	71.00	78.00	85.00	92.00	99.00	113.00	796
26							43.00	51.00	59.00	67.00	75.00	83.00	91.00	99.00	107.00	115.00	131.00	735
30								61.00	72.00	83.00	94.00	105.00	116.00	127.00	138.00	149.00	171.00	637
36									110.50	126.00	141.50	157.00	172.50	188.00	203.50	219.00	250.00	531

In ordering, be careful to state *Diameter*, *Thickness*, *Size of Hole*, and *Number of Carborundum* and *Grade*, or give us sufficient information to enable us to determine these last points.

Cylinders

THE following price list is for cylinders seven inches in length. Other lengths are at proportionate prices.

To run a cylinder or a cup wheel at too high a speed decreases its efficiency. A cylinder or a cup may prove worthless at the speed of a regular disc wheel, but do first-class work at half the speed. In ordering, please state the diameter, length and thickness of wall.

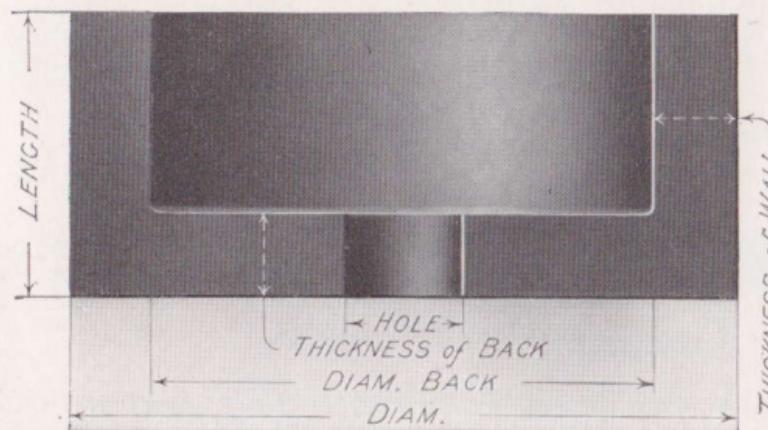
See sectional view of cup wheel, page 17.

THICKNESS OF WALL	DIAMETER IN INCHES										
	8	9	10	12	14	16	18	20	22	24	26
1 inch,	\$15.50	\$16.50	\$17.75	\$18.75	\$22.50	\$26.00	\$28.80	\$30.90	\$35.00	\$37.50	\$39.75
1½ "		22.00	24.25	26.25	31.00	35.75	40.25	44.00	49.75	54.25	59.80
2 "			29.50	33.00	38.50	44.60	51.40	56.25	65.00	70.50	77.00
2½ "				38.75	45.50	53.00	61.40	67.40	79.40	86.25	93.00
3 "					44.00	51.50	60.25	71.00	78.50	91.50	99.50
3½ "						57.50	67.60	79.00	87.60	103.90	113.60
4 "						61.50	73.00	86.90	97.00	115.50	126.60
Revolutions per min.	1425	1275	1150	950	825	725	625	575	525	475	375

Cup Wheels

THE list price of a cup wheel is found by adding to the list price of a cylinder (see price list, page 16) of the same dimensions, the list price of a regular solid wheel (see price list, page 15),

whose diameter is the inside diameter of the cylinder or diameter of back (see sectional view) and thickness of back.



Cup wheels three inches and under in length, or with inside diameter of cylinder less than six inches, are sold at prices of regular solid wheels.

In ordering, please state the diameter, length, thickness of wall, thickness of back, arbor hole, and full description of work for which wheel is intended.

Wheels for Wood Working Tools

MANUFACTURING a wheel for saw gumming or sharpening, the grinding of moulding cutters, planer knives, etc., is a specialty quite apart from ordinary grinding wheels, and while carborundum is an ideal material for this class of work, it has taken several years of patient, sometimes discouraging, work to put the material into a perfect wheel.

We now have to offer to this class of trade a wheel perfectly adapted to the requirements, with a guarantee that it excels any wheel ever made on the three following points: long life, rapid cutting, cool cutting.

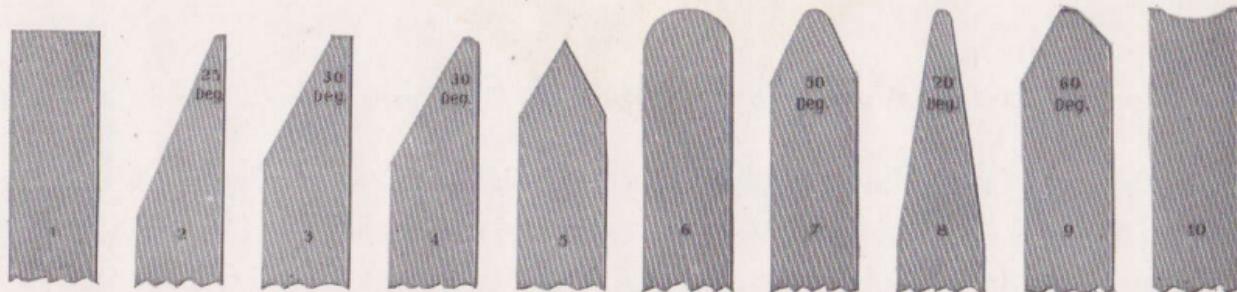
To try a wheel is to be convinced of these three points.

All carborundum wheels are waterproof.



Covel Saw Gummers

We illustrate herewith a carborundum wheel twelve inches in diameter, three-quarter inch thick, of the Covel shape. We are prepared to furnish this shape of wheel in any diameter and of any thickness. Prices on these wheels are the same as regular wheels.



Shapes of Wheel Edges

For Saw Gummers and Wheels for Moulding Knives

THE above diagrams illustrate the most common forms of edges or faces given to wheels for sharpening saws and moulding knives. The beveled and concaved shapes are made by turning up the plain No. 1 shape with a diamond. There is practically no limit to the forms that may be produced by a handy man, with a diamond point to work with.

In ordering wheels, state the shape desired.

Wheels of Special Shapes

WE make a specialty of manufacturing wheels of special shapes and sizes for all classes of grinding, such as cylindrical, spindle and arbor grinding, milling cutters of various descriptions, taps, reamers and dies, lathe tools, twist drill and machine knives, and are prepared to furnish from stock special wheels for all the well-known grinding machines, as Brown & Sharpe and Landis cylindrical and universal grinding machines, Cincinnati, Walker, Wells, and Bath universal cutter and reamer grinders. Springfield, Diamond, Barnes, Whitney, Sellers, Ransom, and Gisholt tool grinders; Yankee, Worcester and American twist drill grinders; Buffalo, Carver, Fay, and Woods knife grinders. In fact, we are equipped to furnish promptly any shape of carborundum wheel which is within the possibility of manufacture, and earnestly solicit such trade.

Suggestions

WHEN ordering wheels, carefully state: (1) Quantity required; (2) diameter of wheels; (3) thickness of wheels; (4) size of arbor hole; (5) degree of coarseness of grain (see page 8); (6) degree of hardness (see page 12); (7) complete description of work intended for wheels. Particular care should be given to state fully the kind of material to be ground; also, if the work is to be ground on the face or side of wheel, and if the work is applied to the wheel automatically. (8) Speed of arbor on which the wheel will run.

Wheels should be mounted on arbors of ample size, between flanges slightly concave, of at least one-third the size of the wheel, with rubber or leather washers between wheel and flanges. Wheel should always slide on the arbor easily, and should never be forced. It is essential for good results that the speed of wheel be as is recommended by us. (See page 15). Every wheel of eight inches and over in diameter bears a speed label showing operating speed and speed at which it has been tested. If our wheels are not perfectly satisfactory do not continue to use them; notify us and we will exchange them for others of more efficient grade.

Carborundum Cloth and Prices

LIKE all other Carborundum products, Carborundum Cloth stands undisputedly at the head of all abrasives of this class. This is a strong statement, but is made without qualifications after numerous comparative trials have shown that Carborundum Cloth does quicker, cleaner and better work than the best makes of emery cloths. We would confidently invite the most rigorous tests, for we know the results will prove that Carborundum Cloth is cheaper to use than any goods of like character on the market.

Carborundum Cloth is numbered according to the size of the grain used. The standard sizes in which cloth is cut are shown in price list, and always kept in stock. Special sizes and shapes will be furnished as required, for which prices will be quoted on application. When ordering, please specify the quantity, size and shape desired, and if possible, the number according to our grading. If this is impractical, give the number and make of cloth in use. Sample books showing the numbers of Carborundum Cloth will be sent free upon request.

Sheets

¼ ream package; ½ ream in packages; ¾ ream in packages; 1 ream package.

GRIT NUMBERS	9x11 inches
Powder (F, FF, FFF), per ream	\$18.00
Nos. 220 to 70, per ream	18.00
No. 60, per ream	20.00
No. 50, per ream	24.00
No. 40, per ream	26.00
No. 36, per ream	28.00
No. 30, per ream	31.00
No. 24, per ream	34.00

Rolls

50 yards in length; double coated.

GRIT NUMBERS	9 inch	18 inch	27 inch
Nos. 220 to 70	\$ 7.50	\$15.00	\$22.50
No. 60	9.00	18.00	27.00
No. 50	10.50	21.00	31.50
No. 40	12.50	25.00	37.50
No. 36	14.50	29.00	43.50
No. 30	16.50	33.00	49.50
No. 24	19.00	37.00	55.50

Carborundum Paper and Prices

We invite the attention of the Wood Industrial Trade to Carborundum Paper. We are now manufacturing paper especially for the wood trade, and claim for it that it is sharper, faster cutting and leaves a smoother, cleaner and better finish than the garnet, ruby or any sandpaper. We manufacture paper in sheets 9x11, or in rolls containing 50 yards, in widths 24, 30, 36, 40, 42 and 48 inches.

Carborundum Paper is also being very extensively used by painters and decorators for removing paint and for rubbing down surfaces. The uniformity and sharpness of the grit makes Carborundum Paper exceptional for these purposes.

Carborundum Paper, like Cloth, is numbered according to the size of the grain used. Special sizes and shapes will be furnished as requested, for which prices will be quoted on application. Sample books, showing all numbers of paper, will be sent free upon request.

GRIT NUMBERS	SHEETS		ROLLS, 50 YARDS IN LENGTH					
	9x11 inches Per Ream	24 Inches Wide	30 Inches Wide	36 Inches Wide	40 Inches Wide	42 Inches Wide	48 Inches Wide	
Nos. 220 to 70	\$6.50	\$7.50	\$9.75	\$12.00	\$14.00	\$16.25	\$20.00	
No. 60	7.00	7.75	10.25	12.50	14.50	16.75	21.00	
No. 50	7.50	8.00	10.75	13.00	15.25	17.25	21.50	
No. 40	8.00	8.50	11.25	13.50	15.75	17.75	22.00	
No. 36	8.50	9.25	12.00	14.00	16.25	18.25	23.75	
No. 30	9.75	10.25	13.00	15.25	17.25	20.00	27.00	
No. 24	11.00	12.00	15.25	17.25	20.00	21.75	31.00	
No. 20	12.00	13.00	17.25	20.00	22.75	24.75	34.00	

Carborundum Cloth and Paper Discs

SURFACE or disc grinding machines are to-day as indispensable in the machine shop for true, accurate, rapid work on flat surfaces as the universal grinding machine is on circular work.

Carborundum paper and cloth discs are manufactured specially for this class of work, and are made in all grits in paper No. 24 and cloth No. 40; very coarse for rough work, to paper and cloth No. 220; very fine, for the very finest finishing and polishing.

Carborundum cloth and paper discs show the same economy over other abrasives in this class of work as in all other products.

We are prepared to furnish immediately any size of disc in either paper or cloth. We list herewith a few of the sizes and grits of discs that we are called upon to furnish.

We also manufacture solid carborundum rings for surface or disc grinder where it is desirable to use water. Prices for solid rings are figured on regular wheel list, allowance being made for hole when larger than six inches in diameter. Solid rings list prices are subject to our regular discount.

Prices Carborundum Cloth Discs

Plain or with any size hole in center

Diameter in Inches	10	12	14	16	18	20	24	27
220—70 grit, per disc	\$0.10	\$0.11	\$0.14	\$0.18	\$0.20	\$0.30	\$0.35	\$0.40
60 grit, per disc . . . . .	.11	.12	.15	.19	.21	.32	.37	.42
50 " "	.12	.13	.16	.21	.23	.35	.41	.47
40 " "	.13	.14	.17	.22	.25	.37	.43	.49
36 " "	.13	.14	.18	.23	.26	.39	.45	.51
30 " "	.14	.15	.19	.25	.27	.41	.48	.54
24 " "	.15	.16	.20	.26	.29	.44	.51	.58

Prices Carborundum Paper Discs

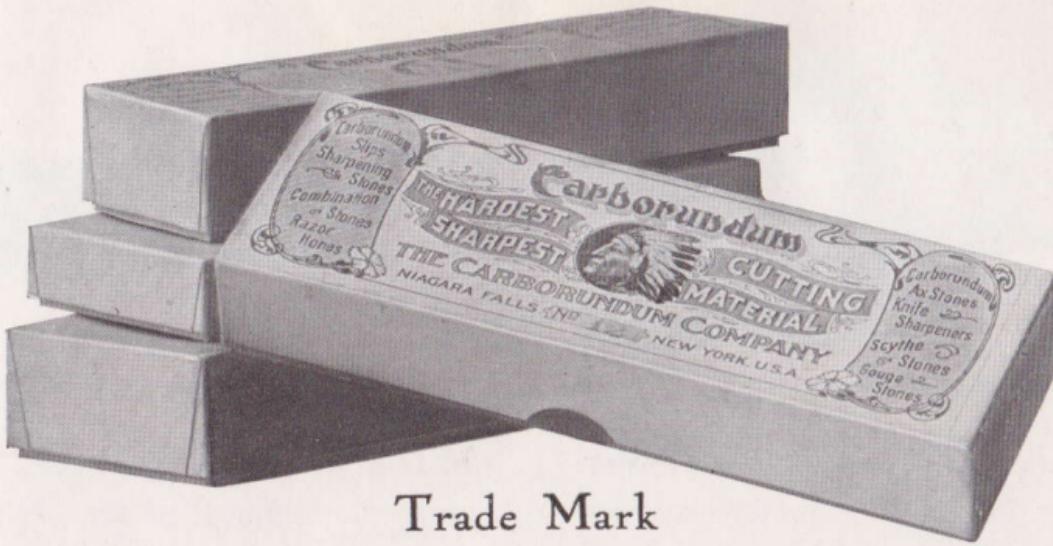
Plain or with any size hole in center

Diameter in Inches	10	12	14	16	18	20	24	27
220—60 grit, per disc	\$0.03	\$0.04	\$0.06	\$0.07	\$0.08	\$0.11	\$0.14	\$0.16
50 and 40 " "	.03	.04	.06	.07	.09	.12	.15	.17
36 " "	.04	.05	.07	.08	.09	.12	.16	.18
30 " "	.04	.05	.07	.08	.10	.13	.16	.19
24 " "	.04	.05	.08	.09	.10	.14	.18	.20

Specialties

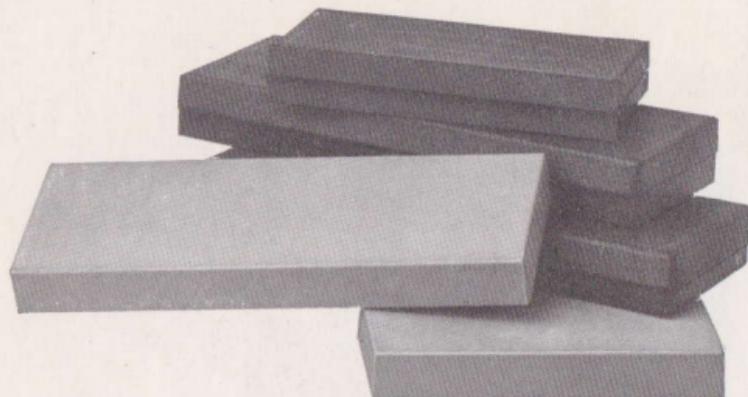
UNDER the name of *Specialties* we manufacture an almost endless variety of small articles. It is our constant aim to render all possible assistance to those who desire to take advantage of the exceptional qualities of Carborundum, and to that end we are prepared to make up specialties of any shape our friends may wish, subject only to the possibilities of our process of manufacture. For this special work we charge no more than the equivalent of our standard forms, with sufficient added to cover cost of moulds, should such be needed.

On the following pages we illustrate and list a few of the standard forms. These goods we offer to the trade, and particularly to the retail hardware dealers, as articles of the very highest merit. The prices are a trifle higher than asked for many goods of similar form and size now on the market, but when the superior quality of Carborundum stones is considered, the cost to the user is actually less. The first cost of articles of this kind bears a relation to their ultimate value which is comparatively insignificant. The rapidity with which the work is accomplished, the satisfaction of having it properly done, and the pleasure of having a stone sharp, clean and bright, never glazed or filled, always ready for service, outweigh many times the slightly increased expenditure.



Trade Mark

THE Indian Head is a special trade mark which has been adopted by The Carborundum Company, and appears upon the labels of all packages of stones of their manufacture. It is the "Hall Mark" of excellence. Its presence indicates that the highest grade of materials and labor enter into the contents of the package, and that no better goods may be had at any price. The application of the label is shown in the cut above.



Razor Hones

MADE of extra fine, hand-washed powder. Unexcelled for fast cutting qualities and for producing a keen, lasting edge.

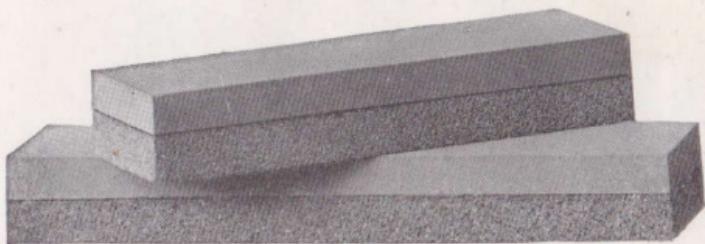
No. 101, 6x2 x $\frac{5}{8}$ inch.	Per hone, \$1.50
No. 103, 4x2 x $\frac{1}{2}$ inch.	Per hone, 1.00
No. 105, 8x2 $\frac{1}{2}$ x $\frac{3}{4}$ inch.	Per hone, 3.00



Instrument Hone

MADE of the very finest, hand-washed powder. Unexcelled for producing a keen edge. A very useful hone for surgeons and dentists. Furnished in a neat, black leather case, convenient size for instrument case.

No. 100, 4x1x $\frac{3}{8}$ inch.	Per hone, \$0.75
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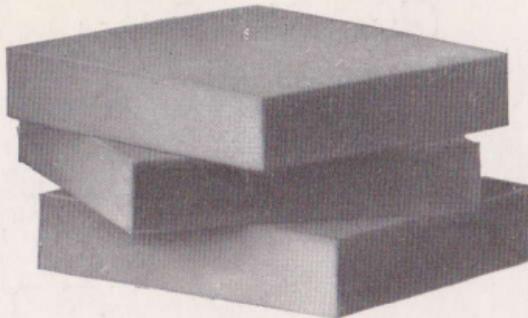
Combination Stones

THESE Stones are designed especially for carpenters and mechanics.

They are made with one face of coarse and one face of very fine grit. The coarse side can be used for sharpening dull tools, the fine side for tools requiring a keen, sharp edge.

Made in Two Sizes

No. 108, 8x2x1 inch.	Per stone, \$1.25
No. 109, 6x2x1 inch.	Per stone, 1.00



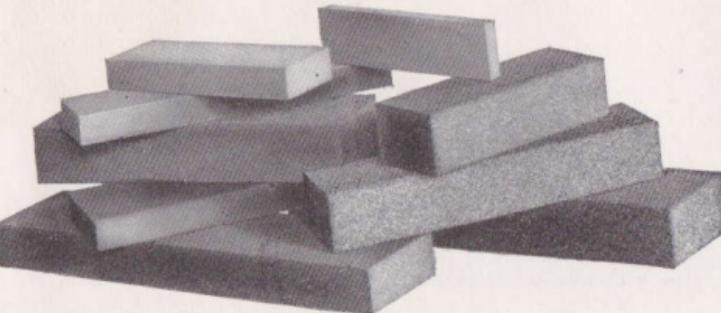
Ax Stones

No. 195, $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{2}$ inch

Per dozen, \$3.00

Sharpening Stones

POSITIVELY unequaled for rapid cutting qualities. Used dry, or with water or oil. Are quite porous, and may be tempered in their cutting by filling with wax or vaseline.

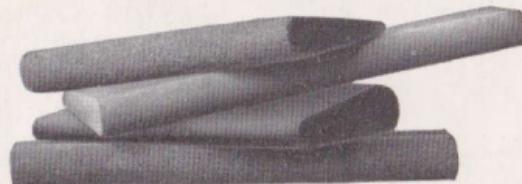


Number	Length Inches	Width Inches	Thickness	No. of Carbo- rundum	Price per Stone	Number	Length Inches	Width Inches	Thickness	No. of Carbo- rundum	Price per Stone	Number	Length Inches	Width Inches	Thickness	No. of Carbo- rundum	Price per Stone	
115	8	8	1	FF (fine)	\$1.00	124	6	12	2	5/8	FF (fine)	\$.60	139	4	1 1/2	1	FF (fine)	\$.55
116	8	8	1	180 (medium)	.80	125	6	12	2	5/8	180 (medium)	.45	140	4	1 1/2	1	180 (medium)	.40
117	8	8	1	120 (coarse)	.80	126	6	12	2	5/8	120 (coarse)	.45	141	4	1 1/2	1	120 (coarse)	.40
118	8	8	3/4	FF (fine)	.80	127	6	1 1/2	1	FF (fine)	.65	142	4	1 1/2	1/2	FF (fine)	.40	
119	8	8	3/4	180 (medium)	.60	128	6	1 1/2	1	180 (medium)	.50	143	4	1 1/2	1/2	180 (medium)	.30	
120	6	12	3/4	120 (coarse)	.60	129	6	1 1/2	1	120 (coarse)	.50	144	4	1 1/2	1/2	120 (coarse)	.30	
121	6	12	1	FF (fine)	.80	130	6	1 1/2	1/2	FF (fine)	.45	145	4	1	1/4	FF (fine)	.25	
122	6	12	1	180 (medium)	.60	131	6	1 1/2	1/2	180 (medium)	.35	146	4	1	1/4	180 (medium)	.20	
123	6	12	1	120 (coarse)	.60	132	6	1 1/2	1/2	120 (coarse)	.35	147	4	1	1/4	120 (coarse)	.20	

Slip Stones

ARE made in four sizes and three different grits of each size. These Slip Stones cut rapidly and hold their shape perfectly.

	Per Stone
No. 174, 6x2 x $\frac{5}{8}$ - $\frac{3}{16}$ inch, FF (fine)	\$.70
No. 175, 6x2 x $\frac{5}{8}$ - $\frac{3}{16}$ inch, 180 (medium)	.55
No. 176, 6x2 x $\frac{5}{8}$ - $\frac{3}{16}$ inch, 120 (coarse)	.55
No. 177, 6x1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{8}$ inch, FF (fine)	.65
No. 178, 6x1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{8}$ inch, 180 (medium)	.50
No. 179, 6x1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{8}$ inch, 120 (coarse)	.50

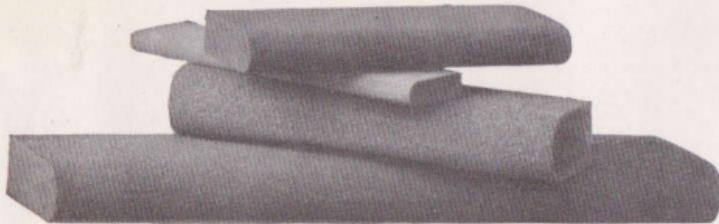


	Per Stone
No. 180, 4x2 x $\frac{5}{8}$ - $\frac{3}{16}$ inch, FF (fine)	\$.50
No. 181, 4x2 x $\frac{5}{8}$ - $\frac{3}{16}$ inch, 180 (medium)	.35
No. 182, 4x2 x $\frac{5}{8}$ - $\frac{3}{16}$ inch, 120 (coarse)	.35
No. 183, 4x1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{8}$ inch, FF (fine)	.45
No. 184, 4x1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{8}$ inch, 180 (medium)	.30
No. 185, 4x1 $\frac{1}{2}$ x $\frac{3}{8}$ - $\frac{1}{8}$ inch, 120 (coarse)	.30

Round Edge Gouge Stones

Made in Three Grits

UNEXCELLED for quick cutting and retain shape perfectly.



	Per Stone		Per Stone
No. 160, 8x2 x $\frac{3}{4}$ inch, FF (fine)	\$0.90	No. 166, 4x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, FF (fine)	\$0.50
No. 161, 8x2 x $\frac{3}{4}$ inch, 180 (medium)	.70	No. 167, 4x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, 180 (medium)	.40
No. 162, 8x2 x $\frac{3}{4}$ inch, 120 (coarse)	.70	No. 168, 4x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, 120 (coarse)	.40
No. 163, 5x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, FF (fine)	.55	No. 169, 4x1 x $\frac{1}{4}$ inch, FF (fine)	.35
No. 164, 5x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, 180 (medium)	.35	No. 170, 4x1 x $\frac{1}{4}$ inch, 180 (medium)	.30
No. 165, 5x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, 120 (coarse)	.35	No. 171, 4x1 x $\frac{1}{4}$ inch, 120 (coarse)	.30

Oil Stones

MAINTAINED in handsomely polished Aluminum Boxes.

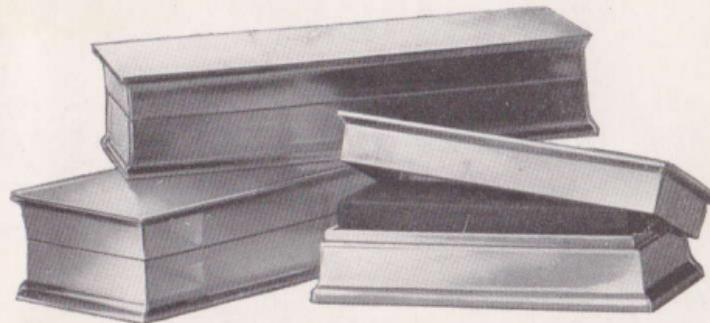
Complete in Box	Per Stone
No. 108, Combination Stone, 8x2x1 inch,	\$2.00

No. 109, " "	6x2x1 inch, 1.75
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No. 115, Sharpening Stone, 8x2x1 inch,	1.75
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No. 116, " "	8x2x1 inch, 1.50
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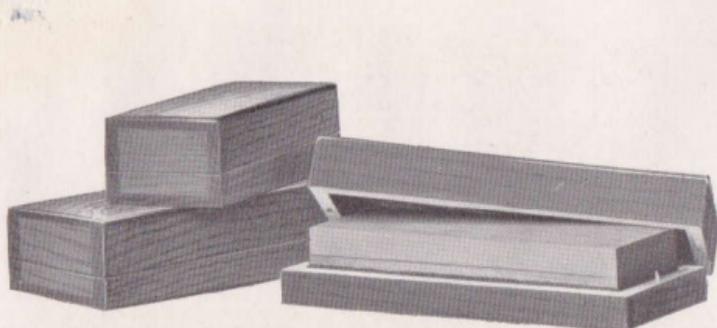
No. 121, " "	6x2x1 inch, 1.50
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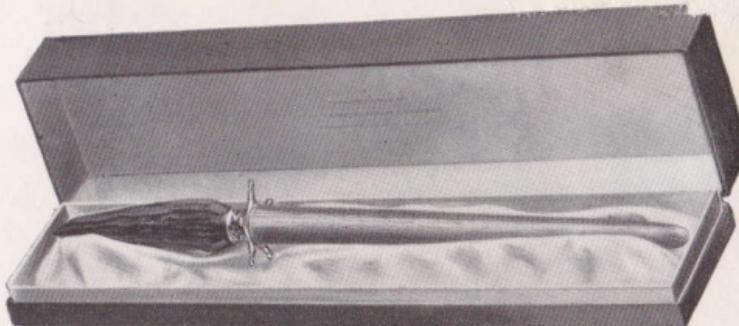
Complete in Box	Per Stone
No. 122, Sharpening Stone, 6x2 x1 inch,	\$1.25
No. 139, " "	4x1½x1 inch, 1.20
No. 140, " "	4x1½x1 inch, 1.00

Oil Stones

MAINTAINED in highly-finished Quartered
Oak Boxes.



Complete in Box	Per Stone
No. 108, Combination Stone, 8x2x1 inch,	\$1.50
No. 109, " " 6x2x1 inch,	1.25
Complete in Box	Per Stone
No. 115, Sharpening Stone, 8x2x1 inch,	1.25
No. 122, Sharpening Stone, 6x2 x1 inch,	\$0.80
No. 116, " " 8x2x1 inch,	1.00
No. 139, " " 4x1½x1 inch,	.75
No. 121, " " 6x2x1 inch,	1.00
No. 140, " " 4x1½x1 inch,	.60

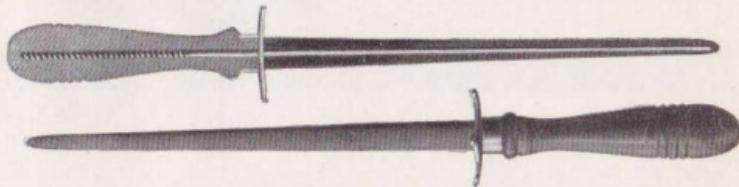


Stag Handle Carborundum Knife Sharpener

THIS knife sharpener has a steel rod extending through the centre the entire length of the carborundum shaft, and is screwed into the stag handle, giving the carborundum shaft greater strength.

The stag handle is the very best imported stag horn, highly polished.

This sharpener is put up very attractively in a dark green box lined with white satin.
Length of sharpener over all, 12 inches, Price, \$0.75



Knife Sharpener

A SOLID shaft of carborundum, firmly secured to handle by a steel rod extending its entire length giving it strength and durability.

Per Dozen
Length over all, 12 inches, \$3.00



Scythe Stones

A STRONG, durable and wonderfully rapid cutting stone.

No. 190, 10 inches long. Per dozen, \$2.40

No. 191, 12 inches long. Per dozen, 3.00



Strop

THIS strop is designed especially for shoemakers and leather workers. One face of strop is made of coarse grit and one face of very fine grit.

Length over all, 12 inches. Per dozen, \$2.40

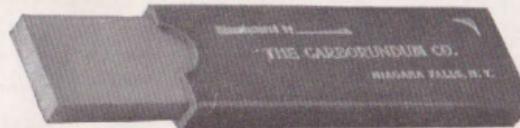


Sportsmen's Combination Stone

THIS stone is designed for the Sportsmen's Hunting Outfit. One side of stone is of a coarse grit, to sharpen very dull knives; the other side is of a very fine grit, to put the keen edge on knives.

Furnished in a neat, soft leather case, convenient size for pocket.

No. 114, 4x1x $\frac{3}{8}$ inches. Per stone, \$0.75



Pocket Stones

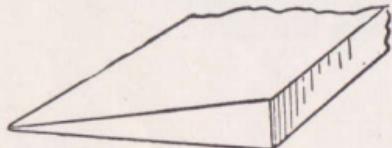
A VERY useful stone for sharpening the pen knife, hunting knife or ink scratcher.

Furnished in neat leather case, convenient size for pocket.

Complete in Case	Per Stone
No. 145, 4x1x $\frac{1}{4}$ inch (fine)	\$0.40
No. 146, 4x1x $\frac{1}{4}$ inch (medium)	.35

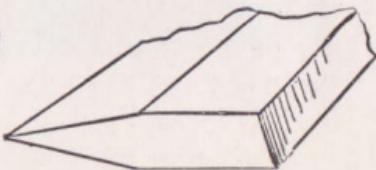
Carvers' Slips

PRODUCES keen cutting edge quick; made in four different shapes, and three grits; manufactured especially for sharpening the tools of engravers, chasers of metal, wood carvers, etc.

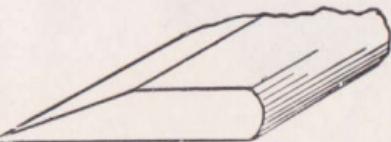
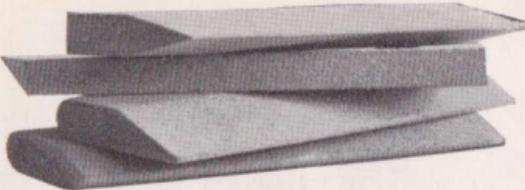


Shape Nos. 80, 81, 82.

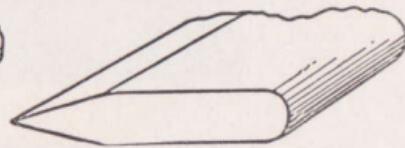
DRAWINGS, FULL SIZE



Shape Nos. 83, 84, 85.



Shape Nos. 86, 87, 88.



Shape Nos. 89, 90, 91

DRAWINGS, FULL SIZE.

	Per Stone
No. 80, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, FF (fine)	\$0.35
No. 81, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, F (medium fine) . . . . .	.25
No. 82, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, 180 (medium) . . . . .	.25
No. 83, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, FF (fine) . . . . .	.35
No. 84, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, F (medium fine) . . . . .	.25
No. 85, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, 180 (medium) . . . . .	.25
No. 86, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, FF (fine) . . . . .	.35
No. 87, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, F (medium fine) . . . . .	.25
No. 88, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, 180 (medium) . . . . .	.25
No. 89, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, FF (fine) . . . . .	.35
No. 90, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, F (medium fine) . . . . .	.25
No. 91, $2\frac{1}{4} \times \frac{7}{8} \times \frac{3}{16}$ inch, 180 (medium) . . . . .	.25



Points

FOR DIE SINKERS. HARD AND SHARP.
THREE INCHES LONG. MADE IN THREE GRITS.

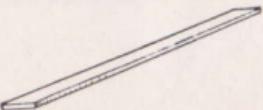
No. 97, FF (fine)	Per stone, \$0.75
No. 98, 180 (medium)	Per stone, .50
No. 99, 120 (coarse)	Per stone, .50

Silversmiths' Stones

Special Sizes and Shapes for Silversmiths, Watchmakers and General Die Work

Size $4 \times \frac{1}{2} \times \frac{1}{16}$ inch Per Stone

No. 300, FF (fine)	\$0.60
No. 301, 220 (medium fine)	.40
No. 302, 150 (medium)	.40



Size $4 \times \frac{1}{2} \times \frac{1}{4} \times \frac{7}{32} \times \frac{5}{64}$ inch

No. 303, FF (fine)	.75
No. 304, 220 (medium fine)	.50
No. 305, 150 (medium)	.50



Size $4 \times \frac{1}{16} \times \frac{3}{32} \times \frac{1}{16}$ inch

No. 306, FF (fine)	.75
No. 307, 220 (medium fine)	.50
No. 308, 150 (medium)	.50



Size $4 \times \frac{1}{2} \times \frac{9}{32} \times \frac{1}{4} \times \frac{1}{8}$ inch

No. 309, FF (fine)	.75
No. 310, 220 (medium fine)	.50
No. 311, 150 (medium)	.50



Size $4 \times \frac{9}{16} \times \frac{3}{16} \times \frac{3}{16} \times \frac{1}{16}$ inch Per Stone

No. 312, FF (fine)	\$0.75
No. 313, 220 (medium fine)	.50
No. 314, 150 (medium)	.50



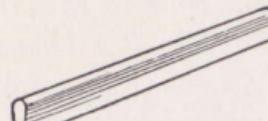
Size $4 \times \frac{3}{8} \times \frac{1}{8} \times \frac{3}{16} \times \frac{1}{16}$ inch

No. 315, FF (fine)	.75
No. 316, 220 (medium fine)	.50
No. 317, 150 (medium)	.50



Size $4 \times \frac{1}{2} \times \frac{3}{16} \times \frac{3}{32}$ inch

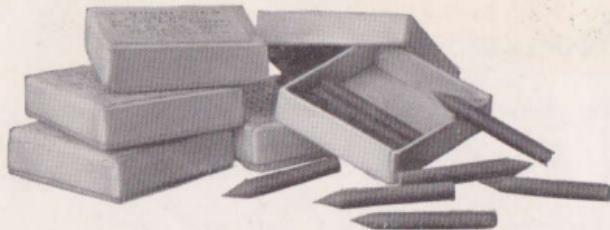
No. 318, FF (fine)	.45
No. 319, 220 (medium fine)	.30
No. 320, 150 (medium)	.30



Size $3\frac{1}{2} \times \frac{9}{16} \times \frac{7}{32}$ inch

No. 321, FF (fine)	.75
No. 322, 220 (medium fine)	.50
No. 323, 150 (medium)	.50





Engravers' Carborundum Pencil Points

THESE Pencil Points are manufactured for the use of Engravers, Die Sinkers, Mould Makers and Metal Chasers.

The Points are one-eighth of an inch in diameter, one inch in length; of three grits, coarse, medium and fine. They are put up in boxes containing twelve Points, of one grit or assorted grits, as desired.

Price, per box, \$0.75



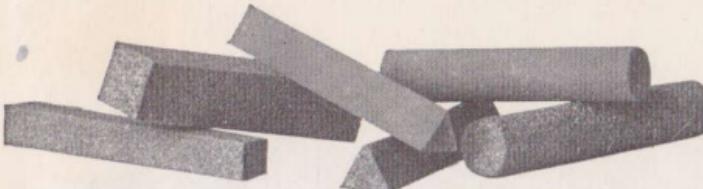
Engravers' Chuck

THIS Chuck is a very convenient tool for holding Pencil Points.

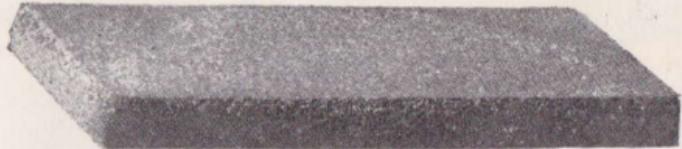
The Chuck is made from Steel Tubing, Knurled and Nickel Plated.

Price, per Chuck and one dozen Points, \$1.00

Carborundum Sticks



SQUARE STICKS					ROUND STICKS					TRIANGULAR STICKS				
Number	Length Inches	Thick- ness	No. of Carbo- rundum	Price per Stick	Number	Length Inches	Diam- eter	No. of Carbo- rundum	Price per Stick	Number	Length Inches	Thick- ness	No. of Carbo- rundum	Price per Stick
1	4	1	FF (fine)	.40	30	4	1	FF (fine)	.45	60	4	1	FF (fine)	.50
2	4	1	180 (medium)	.30	31	4	1	180 (medium)	.35	61	4	1	180 (medium)	.35
3	4	1	120 (coarse)	.30	32	4	1	120 (coarse)	.35	62	4	1	120 (coarse)	.35
4	4	3/4	FF (fine)	.40	33	4	3/4	FF (fine)	.45	63	4	3/4	FF (fine)	.50
5	4	3/4	180 (medium)	.30	34	4	3/4	180 (medium)	.35	64	4	3/4	180 (medium)	.35
6	4	3/4	120 (coarse)	.30	35	4	3/4	120 (coarse)	.35	65	4	3/4	120 (coarse)	.35
7	4	5/8	FF (fine)	.35	36	4	5/8	FF (fine)	.40	66	4	5/8	FF (fine)	.40
8	4	5/8	180 (medium)	.25	37	4	5/8	180 (medium)	.30	67	4	5/8	180 (medium)	.30
9	4	5/8	120 (coarse)	.25	38	4	5/8	120 (coarse)	.30	68	4	5/8	120 (coarse)	.30
10	4	1/2	FF (fine)	.35	39	4	1/2	FF (fine)	.35	69	4	1/2	FF (fine)	.35
11	4	1/2	180 (medium)	.25	40	4	1/2	180 (medium)	.25	70	4	1/2	180 (medium)	.25
12	4	1/2	120 (coarse)	.25	41	4	1/2	120 (coarse)	.25	71	4	1/2	120 (coarse)	.25
13	4	3/8	FF (fine)	.30	42	3	3/8	FF (fine)	.30	72	3	3/8	FF (fine)	.30
14	4	3/8	180 (medium)	.20	43	3	3/8	180 (medium)	.20	73	3	3/8	180 (medium)	.20
15	4	3/8	120 (coarse)	.20	44	3	3/8	120 (coarse)	.20	74	3	3/8	120 (coarse)	.20
16	4	1/4	FF (fine)	.30	45	2	1/4	FF (fine)	.30	75	2	1/4	FF (fine)	.30
17	4	1/4	180 (medium)	.20	46	2	1/4	180 (medium)	.20	76	2	1/4	180 (medium)	.20
18	4	1/4	120 (coarse)	.20	47	2	1/4	120 (coarse)	.20	77	2	1/4	120 (coarse)	.20



No. 200, 6x2½x¼ inch., Per dozen, \$4.00

No. 202, 6x2½x½ inch., Per dozen, \$6.00

Made in all Grits

Undressed Sticks

For Dressed Sticks, see page 41

SQUARE STICKS			
Number	Length in Inches	Thickness	Price per Dozen
325	6	1	\$3.60
326	6	¾	3.50
327	6	5/8	3.30
328	6	½	3.20
332	4	1	2.40
333	4	¾	2.30
334	4	5/8	2.20
335	4	½	2.10
336	4	5/8	2.00
337	4	¼	1.80

Cutters for Potters

THESE are used in pottery and porcelain factories for smoothing up the "biscuit ware."

They have proved superior to any heretofore used. Made in two grits, medium and fine.

No. 201, 6x2½x¾ inch., Per dozen, \$5.00

No. 202, 6x2½x½ inch., Per dozen, \$6.00

ROUND STICKS			
Number	Length in Inches	Diameter	Price Per Dozen
350	4	1	\$2.40
351	4	¾	2.30
352	4	5/8	2.20
353	4	½	2.10
354	4	5/8	1.80
355	4	¼	1.50

Rubbing Bricks and Stones

UNDER the head of Rubbing Bricks and Stones are manufactured a great variety of different shapes and sizes of stones for dressing and smoothing granite and marble, also for scouring castings, chilled iron and steel rolls used in tin plate mills, rolling mills, etc. These stones are not squared up and dressed, but are packed as they come from the kilns. There is practically no limit to the possibility of manufacture in this line, and while we list a few sizes most commonly used and carried in stock, we are prepared to furnish, when called upon, any size or shape of any grit, from the coarsest to the very finest powder. We shall be pleased to quote special prices on any plain or irregular shapes. These stones are all made by our vitrified process, and can be used dry or with water or oil.

Prices for Any Grit, from 20 to FF

No. 210, 8x4x4 inch, Per doz., \$40.00	No. 205, 6x3 x2 inch, Per doz., \$12.70	No. 221, 4x3x3 inch, Per doz., \$12.70
No. 209, 8x4x3 inch, Per doz., 30.50	No. 214, 6x2 x2 inch, Per doz., 9.00	No. 228, 4x3x2 inch, Per doz., 9.00
No. 208, 8x4x2 inch, Per doz., 21.00	No. 215, 6x2 x1 inch, Per doz., 5.60	No. 222, 4x2x2 inch, Per doz., 6.70
No. 207, 8x3x3 inch, Per doz., 23.40	No. 216, 6x2 x $\frac{1}{2}$ inch, Per doz., 3.70	No. 223, 4x2x1 inch, Per doz., 4.30
No. 206, 8x3x2 inch, Per doz., 16.30	No. 217, 5x2 $\frac{1}{2}$ x1 inch, Per doz., 5.75	No. 224, 4x2x $\frac{1}{2}$ inch, Per doz., 3.00
No. 211, 8x2x2 inch, Per doz., 11.40	No. 218, 5x1 $\frac{1}{2}$ x1 inch, Per doz., 4.15	No. 226, 4x1x $\frac{1}{2}$ inch, Per doz., 2.35
No. 212, 8x2x1 inch, Per doz., 6.70	No. 219, 5x1 $\frac{1}{2}$ x $\frac{1}{2}$ inch, Per doz., 2.95	No. 227, 4x1x $\frac{1}{4}$ inch, Per doz., 2.00
No. 213, 6x3x3 inch, Per doz., 18.00	No. 220, 4x4 x $\frac{1}{4}$ inch, Per doz., 21.00	

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